

WHAT IS CLAIMED IS:

1. A surgical stapler comprising:

a) a handle assembly including an elongated barrel portion and an actuation handle mounted for manipulation through a complete actuating stroke which includes an initial clamping stroke segment and at least one subsequent stapling stroke segment;

b) an elongated body extending distally from the barrel portion of the handle assembly and defining a longitudinal axis;

c) a toothed actuation rack supported within the barrel portion of the handle assembly and mounted for incremental linear movement in response to manipulation of the actuation handle;

d) an elongated control rod extending from a distal end of the toothed actuation rack and through the elongated body to a location adjacent a distal end portion thereof; and

e) a disposable loading unit operatively engaged in a distal end portion of the elongated body and including a staple cartridge containing a plurality of staples, an anvil mounted adjacent the cartridge and movable between an open position and a closed position, and an actuator adapted to releasably mate with a distal end portion of the control rod and configured to move in a distal direction relative to the staple cartridge and anvil to initially effectuate movement of the anvil from the open position to the closed position during the clamping stroke and to subsequently effectuate sequential ejection of the staples from the cartridge during number of subsequent stapling strokes.

2. A surgical stapler as recited in Claim 1, wherein  
the actuation handle includes a spring biased pawl member  
configured to selectively engage the toothed actuation rack to  
advance the actuation shaft in response to manipulation of the  
actuation handle.

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3. A surgical stapler as recited in Claim 2, further comprising an engagement hook disposed within the handle assembly and biased toward the toothed actuation rack for initially engaging a keeper notch formed adjacent a distal end of the toothed actuation rack during the clamping stroke segment of the actuation stroke to limit the extent of the linear movement of the toothed actuation rack.

4. A surgical stapler as recited in Claim 3, further comprising release means for manually disengaging the engagement hook from the keeper notch.

5. A surgical stapler as recited in Claim 4, wherein the release means includes at least one release knob operatively associated with the handle assembly, and a pivoting release member operatively connected to the release knob which has a release finger projecting therefrom to interact with a flange projecting from the engagement hook.

6. A surgical stapler as recited in Claim 4, wherein the toothed actuation rack has a particular rack length and the staple cartridge houses a staple line having a particular linear dimension which is less than or equal to the rack length of the toothed actuation rack.

7. A surgical stapler as recited in Claim 6, further comprising retracting means for effectuating manual retraction of the toothed actuation rack in a proximal direction at any point in the actuating stroke to facilitate retraction of the actuator and movement of the anvil from the closed position to the open position.

8. A surgical stapler as recited in Claim 7, wherein the retracting means comprises at least one retracting knob operatively associated with the barrel portion of the handle assembly, and a release plate mounted adjacent the toothed

~~actuation rack and movable with respect thereto in response to initial proximal movement of the retracting knob for moving the engagement hook and the pawl out of engagement with the toothed actuation rack.~~

9. A surgical stapler as recited in Claim 8, wherein the release plate includes a pair of spaced apart angled cam slots, and a pair of cam pins project laterally from the toothed actuation rack to interact with the angled cam slots so as to facilitate relative movement of the release plate and the actuation shaft.

10. A surgical stapler as recited in Claim 9, further comprising a constant force spring disposed adjacent a proximal end of the barrel portion and operatively connected to the toothed actuation rack for biasing the toothed actuation rack and actuation shaft in a proximal direction.

11. A surgical stapler as recited in Claim 2, wherein the actuator includes an elongated actuation beam having a coupling at a proximal end thereof for receiving the distal end portion of the elongated control rod, and a support flange at a distal end portion thereof supporting a knife blade configured to form an incision in stapled body tissue.

12. A surgical stapler as recited in Claim 11, wherein the actuator further includes a cam roller mounted adjacent the support flange and configured to translate relative to an exterior camming surface of the anvil to effectuate movement of the anvil from the open position to the closed position.

13. A surgical stapler as recited in Claim 11, wherein an actuation sled is supported within the staple cartridge and is mounted to translate ahead of the support flange to sequentially interact with a plurality of staple pushers housed within the staple cartridge adjacent the staples.

14. A surgical stapler as recited in Claim 13, wherein the actuation sled is only mounted for translation in a distal direction in response to movement of the actuation beam.

15. A surgical stapler as recited in Claim 11, wherein the disposable loading unit includes a carrier having a distal housing portion configured to support the staple cartridge and anvil, and a proximal mounting portion dimensioned for reception in the distal end portion of the elongated body.

16. A surgical stapler as recited in Claim 15, further comprising a lockout assembly mounted within the carrier adjacent a proximal end thereof and configured to interact with the distal end portion of the control rod to limit the range of longitudinal translation of the control rod within the coupling at the proximal end of the actuation beam once the toothed actuation rack has been withdrawn to a proximal-most position.

17. A surgical stapler as recited in Claim 16, wherein the lockout assembly includes a spring biased blocking plate mounted for movement in a direction transverse to the longitudinal axis of the elongated body between an initial non-blocking position and a subsequent blocking position.

18. A surgical stapler as recited in claim 17, wherein a support plate is mounted for linear translation with the carrier from a first position, wherein the blocking plate is maintained in the non-blocking position against the bias of a spring to a second position spaced distal of the blocking plate.

19. A surgical stapler as recited in Claim 18, wherein the actuation beam includes means for engaging the support plate to move the support plate from the first position to the second position.